

What is claimed is:

1 1. A printed circuit board (PCB) comprising:  
2 a dielectric board member; and  
3 a first signal line supported on said dielectric board member, said first signal  
4 line including an elongated conductive member that is enshrouded with a carbon-based  
5 cladding over at least a portion of its length.

1 2. The PCB of claim 1, comprising:  
2 a second signal line supported on said dielectric board member, said second  
3 signal line including a second elongated conductive member that is enshrouded with  
4 a carbon-based cladding over at least a portion of its length, said second signal line  
5 being adjacent to said first signal line.

1 3. The PCB of claim 2, wherein:  
2 said carbon-based cladding of said second signal line is continuous with said  
3 carbon-based cladding of said first signal line.

1 4. The PCB of claim 2, wherein:  
2 said carbon-based cladding of said second signal line is discontinuous with said  
3 carbon-based cladding of said first signal line.

1 5. The PCB of claim 1, comprising:  
2 a second dielectric board member disposed above said first dielectric board  
3 member and said first signal line.

1 6. The PCB of claim 1, wherein:  
2 said elongated conductive member is fully covered over top, bottom and side  
3 portions thereof with said carbon-based cladding for said at least a portion of its length.

1 7. The PCB of claim 1, wherein:

2 said elongated conductive member is covered with said carbon-based cladding  
3 over greater than 90% of an outer surface thereof.

1 8. The PCB of claim 1, wherein:

2 said carbon based cladding has a dielectric constant that is greater than a  
3 dielectric constant associated with said dielectric board member.

1 9. A printed circuit board (PCB) comprising:

2 a first metallic member that is covered over at least a portion thereof with a  
3 carbon-based cladding, said first metallic member to form a first node within an  
4 electrical circuit; and

5 a second metallic member proximate to said first metallic member, said second  
6 metallic member to form a second node within the electrical circuit;

7 wherein a portion of said carbon-based cladding provides a finite electrical  
8 resistance between said first metallic member and said second metallic member, said  
9 finite electrical resistance to allow an electrical current to flow between said first and  
10 second nodes of the electrical circuit during circuit operation.

1 10. The PCB of claim 9 wherein:

2 said second metallic member physically contacts said carbon-based cladding of  
3 said first metallic member.

1 11. The PCB of claim 9 wherein:

2 said second metallic member is also covered over at least a portion thereof with  
3 a carbon-based cladding, wherein said carbon-based cladding of said second metallic  
4 member physically contacts said carbon-based cladding of said first metallic member.

1 12. The PCB of claim 9 wherein:

2 said first metallic member includes an elongated signal line conductor.

1 13. The PCB of claim 9 wherein:

2 said first metallic member includes metallic plating within a plated through-  
3 hole.

1 14. The PCB of claim 9 wherein:

2 said first and second metallic members each include an elongated signal line  
3 conductor.

1 15. A multi-layer printed circuit board (PCB) comprising:

2 a first dielectric board member having a signal line supported thereon;  
3 a second dielectric board member having a conductive terminal member  
4 supported thereon; and

5 *conting* a plated through-hole extending through said first and second dielectric board  
6 members, said plated through-hole including a metallic plating covering a carbon-based  
7 cladding adhered to an inner surface of said through-hole;

8 wherein said signal line is conductively coupled to said metallic plating of said  
9 plated through-hole through a portion of said carbon-based cladding, said portion of  
10 said carbon-based cladding to provide a finite electrical resistance between said signal  
11 line and said conductive terminal member within an electrical circuit to be formed  
12 using said multi-layer PCB.

1 16. The multi-layer PCB claimed in claim 15, wherein:

2 said signal line includes an elongated conductive member that is enshrouded  
3 with a carbon-based cladding over at least a portion of its length.

1 17. The multi-layer PCB claimed in claim 15, wherein:

2 said conductive terminal member forms a ground terminal on said second  
3 dielectric board member, said finite electrical resistance to act as a pull-down resistance  
4 within said electrical circuit.

1 18. The multi-layer PCB claimed in claim 15, wherein:  
2 said conductive terminal member forms a supply terminal on said second  
3 dielectric board member, said finite electrical resistance to act as a pull-up resistance  
4 within said electrical circuit.

1 <sup>Sub 1</sup> 19. An electrical subsystem comprising:  
2 a printed circuit board (PCB) including at least one dielectric board member  
3 having a plurality of conductive interconnects for providing circuit interconnections  
4 within said electrical subsystem, said plurality of conductive interconnects including  
5 at least one interconnect that is enshrouded with a carbon-based cladding over at least  
6 a portion thereof; and  
7 a plurality of external electrical components coupled to said plurality of  
8 conductive interconnects of said PCB to form an electrical circuit.

1 20. The electrical subsystem of claim 19, wherein:  
2 said electrical subsystem is a computer processor board and said plurality of  
3 electrical components includes at least one digital processing device.

1 21. The electrical subsystem of claim 19, wherein:  
2 said at least one interconnect is adjacent to another interconnect on said at least  
3 one dielectric board member, said carbon-based cladding to reduce noise coupling  
4 between said at least one interconnect and said another interconnect.

1 22. The electrical subsystem of claim 19, wherein:  
2 said at least one interconnect is covered with said carbon-based cladding over  
3 top, bottom, and side portions thereof.

1 23. The electrical subsystem of claim 19, wherein:  
2 a portion of said carbon-based cladding provides a finite electrical resistance  
3 between two conductive interconnects of said PCB, said finite electrical resistance to  
4 be used as a circuit element within said electrical circuit.

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1 24. A method for manufacturing a printed circuit board (PCB) comprising:  
2 providing a dielectric board member;  
3 depositing a carbon-based cladding on an upper surface of said dielectric board  
4 member;  
5 adding a metallic layer to an upper surface of said carbon-based cladding;  
6 processing said metallic layer to produce a predetermined metallization pattern  
7 on said carbon-based cladding; and  
8 depositing additional carbon-based cladding over at least a portion of said  
9 predetermined metallization pattern.

1 25. The method claimed in claim 24, comprising:  
2 removing carbon-based cladding from a region between two signal lines of said  
3 predetermined metallization pattern to expose a portion of said upper surface of said  
4 dielectric board member.

1 26. The method claimed in claim 24, comprising:  
2 providing a second dielectric board member; and  
3 placing said second dielectric board member over said additional carbon-based  
4 cladding.

1 27. The method claimed in claim 24, wherein:  
2 depositing a carbon-based cladding includes applying a carbon black material  
3 to said upper surface of said dielectric board member.

